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955 L'Enfant Plaza North, S.W.
Washington, D. C. 20024

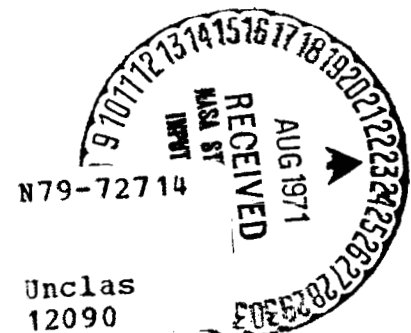
date: July 23, 1971
to: Distribution
from: L. A. Ferrara
subject: Trip Report - Voice Communications
Monitoring During Apollo 15 CDDT
Case 320

B71 07037

ABSTRACT

The performance of the Operational Intercomm System (OIS-RF) was monitored during selected portions of the Apollo 15 Countdown Demonstration Test at KSC on July 12-14, 1971. The system adequately supported the test and voice communications were considered satisfactory with the exception of an occasional period of low voice signal level from Houston Flight.

(NASA-CR-121351) TRIP REPORT - VOICE
COMMUNICATIONS MONITORING DURING APOLLO 15
CDDT (Bellcomm, Inc.) 6 p



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MEMORANDUM FOR FILE

1.0 INTRODUCTION

Voice communications and the performance of the KSC Operational Intercomm System (OIS-RF) were monitored during selected portions of the Apollo 15 Countdown Demonstration Test (CDDT) on July 12-14, 1971. The OIS-RF and associated interfacing communications equipment adequately supported the test although there were some operational and equipment problems noted. Of these, the low level of the HFLT voice signal and the varying VHF audio level from GMIL have been noted during previous tests. The observations listed in Section 2.0 were monitored from Console AD-17 in Firing Room 2 of Launch Control Center-39. Section 3.0 comments further on the voice signal level problem from MCC.

2.0 OBSERVATIONS

(Times listed are EDT.)

2.1 WET CDDT

Backup Voice Communications Checks

July 12

1500 EDT	T-9:00 and holding for built-in hold.
1530	Proceeding into configuration for voice checks.
1545	SCDR in spacecraft very weak on Channel 212 during S-Band check. SLMP very good. SCDR repositioned microphone and was somewhat better on next try.



1550 EDT VHF receiver output audio level approximately 10 dB higher than the S-Band receiver on the astrocomm circuit as monitored in CD&SC.

1600 Houston Flight Controller (HFLT) could not be heard on Channel 214. Houston was not in proper configuration.

1605 Backup voice communications checks concluded satisfactorily.

Terminal Count

July 13

0804 (T-1:30) Sampling of circuits indicate light traffic - no noise evident on circuits.

0854 Power transfer test on all Launch Vehicle stages reported satisfactorily accomplished.

0904 Occasional low level squelch break heard on Channel 151.

0923 HFLT reported "breaking up" on Channel 153. Situation reported to communications control.

0934 Simulated liftoff - commence recycling for dry CDDT.

2.2 DRY CDDT

Backup Voice Communications Checks

July 13

2320 EDT Sampling of circuits involved in backup voice communications checks with MCC indicates high background noise on Channel 212.

2324 Communications control (JROC) reports Channel 212 noise is a Long Lines problem from Houston. Condition corrected by substituting spare circuit.



1148 EDT GMIL reported received signal strength from CSM S-Band transmitter -52 dBm. MOLC receiving signal at -56 dBm. MSS is still in place around Launch Vehicle and parasitic antennae are being used to couple RF energy to the spacecraft.

July 14

0012 HFLT was receiving voice signals from the spacecraft on Channel 214 (VHF) but not Channel 212 (S-Band).

0014 SLMP reports he can hear VHF uplink (Channel 214) but not S-Band (Channel 212) MOLC verified S-Band downlink from spacecraft normal.

0016 GMIL reported a configuration problem at their Communications Technician panel involving the proper S-Band mode.

0019 HFLT very low level on Channel 214. He was reported weak, but clear on the audio side of the modem, but the voice signal was intermittent to non-existent on the OIS-RF channel. Communication Coordination (JROL) reports HFLT about 20 dB lower than normal talkers on channel. HFLT also reported that MSTC was low on Channel 214 to Houston. Trouble ticket #7390-153 issued.

0024 Backup voice communications with HFLT concluded. Reported satisfactory in all modes.

Terminal Count

0704 T-2^h:30^m and counting. Prime crew in Command Module going through switch lists.

0732 Communication problem reported on Aeromed Circuit, Channel 217.

0748 Momentary overload reported on spacecraft main electrical Bus. Cause not determined. Downlink receivers at GMIL and MOLC also observed momentary dip in RF power from the spacecraft transmitters at that time.



- 0845 EDT Spacecraft electrical problem not determined. Spacecraft hatch being opened early as a precautionary measure.
- 0848 Low level noise transients reported on astrocomm circuits to GMIL transmitter. Noise was observed on MOLC spectrum analysers, but apparently was of sufficiently low amplitude and short duration as to not be observed in the Command Module.
- 0921 HFLT reported that CDR was weak and only moderately intelligible (3 x 3) on the first callout during final terminal count voice checks. Subsequent transmissions from CDR were reported satisfactory. This condition was not observed at the author's monitoring position, nor was it observed at MOLC.
- T-15^m
- 0934 Simulated liftoff - all voice communications reported satisfactory. Test personnel standing by to research spacecraft power supply anomaly.

3.0 LOW VOICE SIGNAL LEVELS FROM HOUSTON FLIGHT (HFLT)

Tests of the HFLT Circuit subsequent to the low HFLT voice levels experienced during the backup voice communications test of the Dry CDDT revealed that the problem was apparently internal to the Mission Control Center. It is understood that several HFLT circuits have had line amplifiers added at the consoles to boost the HFLT voice levels.

There have been at least five other documented instances going back to the Apollo 11 CDDT where low HFLT voice levels have been observed during major Apollo tests and launches. (References 1-5). In many of these cases, subsequent checks between communications personnel at KSC (CD&SC) and MSC (MCC Houston FAX) revealed satisfactory signal level and echo return loss readings on the line side of the Long Lines interface. Procedures should be implemented on a regular basis to also verify the quality of the voice signal through the local switching or patching equipment to: (1) the appropriate console and headset at MCC, (2) at least to the OIS interface at KSC.

2034-LAF-vh


L. A. Ferrara



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4. Ferrara, L. A., KSC Voice Communications Monitoring During Apollo 14 CDDT, Case 320, Bellcomm Memorandum for File B71-02009, February 3, 1971.
5. Ferrara, L. A., Trip to KSC to Monitor Voice Communications During the Apollo 15 Flight Readiness Test, Case 320, Bellcomm Memorandum for File B71-07003, July 6, 1971.